

도시 교통망내 태양광 동력화를 위한 버스 천장
구조 최적화 연구

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In this study, two novel urban bus systems are proposed in which the otherwise useless rooftop area is used to install solar photovoltaics. Thus, high land costs and operational problems such as panel overheating, shadowing and dust accumulation on solar panels are solved in urban settings. A mathematical solar power model is developed to determine the annual amounts of harnessed energy under optimum tilt angle and the feasibility of the project is investigated in Tabriz metropolitan city. The optimal tilt angle is determined using a genetic algorithm. The results show that the costs of energy are 0.922 \$/kWh and 0.864 \$/kWh for the optimal proposed single-part and separate-part systems, respectively. We calculated that 233.76 MWh/year green energy could be generated and 398,400 US\$ land costs were saved for solar panel installment by retrofitting the bus rapid transport routes in Tabriz with the novel systems. Acknowledgements This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT). (No.NRF-2017R1E1A1A03070713).